VINEBERG (H. N.)

The Technique and Indications of Vagino-Fixation

(Mackenrodt's Operation).

BY

HIRAM N. VINEBERG, M. D.,

Instructor in Gynæcology in the New York Post-Graduate Medical School and Hospital; Attending Gynæcologist to Mount Sinai Hospital Dispensary and to the Montefiore Home for Chronic Invalids.

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INSTRUCTOR IN GYNÆCOLOGY
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The number of inquiries elicited by a description of a knife and sound * used in vagino-fixation regarding the technique and indications of the operation has induced the writer to offer the present article to the profession. A further inducement he finds in the circumstance that no full description of the operation has been published in this country, excepting one by the author in a special journal,† which, of course, is at the command of a limited number. In order to more readily comprehend the steps of the operation, it is well to bear in mind the anatomy of the parts and what it is intended to accomplish. The intention of the operation is to stitch the fundus of the uterus, or the body as near the fundus as possible, to the anterior vaginal wall at a point from one to two centimetres below the urethral opening.

* *New York Medical Journal*, April 7, 1894.

† *New York Journal of Gynæcology and Obstetrics*, January, 1894.

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A glance at Fig. 1 * will show that, in order to do this, the bladder, which is represented almost empty, must be

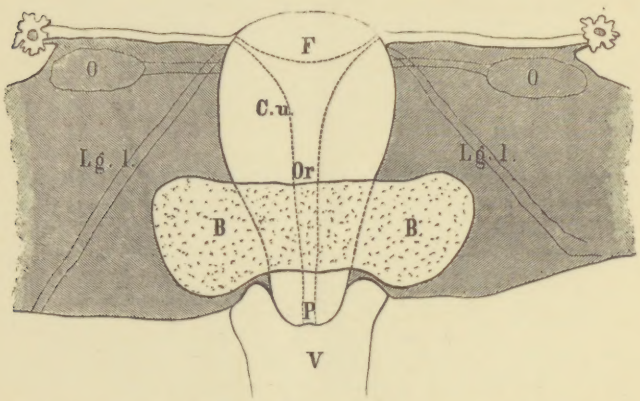

Fig. 1.—Outline of the normal attachments of the bladder (Mackenrodt). O, ovary; Lg. l, lig. latum; F, fundus; C. u., corpus uteri; Or, os internum; P, portio vaginalis; B, attachment of bladder; V, vagina.

pushed up out of the way. Fig. 2 shows the disposition of the bladder after the operation is completed. This disposition of the bladder is accomplished by splitting the anterior vaginal wall with a longitudinal incision, dissecting the two flaps thus formed from the underlying bladder, then cutting the sæptum which holds the bladder to the cervix and pushing up the bladder with the palmar surface of the index finger, as is done in vaginal hysterectomy. The remainder of the operation consists in anteverting the

* Mackenrodt holds that the lateral attachments of the bladder to the anterior surface of the broad ligament, as depicted in the figure, and which he says is a correct representation of the results of several examinations on the cadaver and living, has not been hitherto described. In performing vagino-fixation it is well to bear in mind the outline of the lower border of the bladder attachment, which dips down on either side on the broad ligament.

uterus and suturing it to either vaginal flaps near the urethral opening. The vaginal wound is then brought together by a continuous catgut suture, and the operation is completed.

Now, to describe the technique in detail. The patient is prepared as she would be for a vaginal hysterectomy. For a few days prior to the operation she is given twice daily an antiseptic douche (bichloride, 1 to 5,000). The

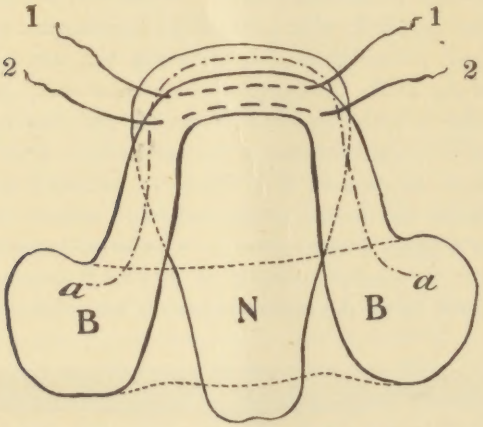

FIG. 2.—Outline of the bladder after vagino-fixation (modified after Mackenrodt to show the higher introduction of the writer's uterine sutures). 1, 2, uterine sutures; B N B, normal bladder attachment; *a a*, outline of bladder after vagino-fixation.

vulva is shaved and thoroughly scrubbed with green soap and warm water the night before and after etherization. The patient is placed in the lithotomy position, with thighs flexed upon the abdomen. Any form of a crutch or leg supporter can be used. In the absence of these, a sheet twisted diagonally, passing over one shoulder and beneath the other, or behind the lower part of the back, the ends being tied around the thighs, answers very well. The va-

gina is now scrubbed with a brush and green soap and warm water. Care must be taken not to use too much force, so as not to cause abrasion of the mucous membrane. The vulva is again thoroughly scrubbed, and both it and the vagina irrigated by an antiseptic solution (bichloride, 1 to 5,000, or preferably lysol, one per cent.).

Before proceeding to the operation proper, I invariably curette the uterus and wash it out with sterilized warm water, for, even if no endometritis be present, which is not often the case, it is well to have a clean aseptic cavity in the event of the needle, in suturing the uterus, going through the whole thickness of the uterine wall. If there be present a pathological laceration of the cervix, this is repaired, or an amputation of the cervix done if the condition seems to demand it. The cervix is then grasped by two volsellæ and drawn downward and outward as far as possible without doing violence. The anterior vaginal wall is caught by another volsella, at a point from one to two centimetres below the urethral opening, and drawn upward.

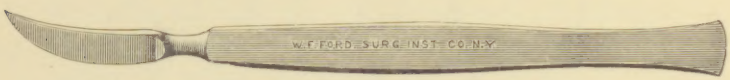

Fig. 3.—Author's knife.

In this way the vaginal wall is put on the stretch. At this stage it is well to pass a sound into the bladder to ascertain the extent to which the bladder is attached to the cervix and to estimate the thickness of the vaginal wall. With a sharp convex-bladed knife (Fig. 3) a longitudinal incision is made in the median line through the anterior vaginal wall, extending from one to two centimetres below the urethral opening to the vaginal attachment of the cervix. The two flaps thus made are separated from the underlying bladder by partly sharp and partly blunt dissections. In

virgins and nulliparæ the attachment of the vaginal wall to the bladder is very firm, and this part of the operation may be attended with some difficulty and quite free hæmorrhage, which can, however, be readily arrested. In dissecting the flaps their width is made to depend upon the degree of the prolapsus or relaxation of the anterior vaginal wall. The *rationale* of this will be seen later. The flaps are made wider near the cervix, and gradually taper toward the upper angle of the incision near the urethral opening. The dissection is thus carried out in the form of a triangle, with the base near the cervix and the apex near the urethral opening.

The two flaps are now held apart by tenacula at the lower angle of the wound and a transverse, slightly curved incision with the convexity toward the cervix is made down upon the cervical tissue. This incision is made in the already denuded surface and cuts through the sæptum binding the bladder to the cervix. It is a wise precaution before making the transverse incision to again ascertain the lower border of the bladder by passing a sound into it, so as to avoid cutting into this important structure. The bladder is now gently pushed up from the cervix and wall of the uterus with the palmar surface of the index finger, as is done in vaginal hysterectomy. In some cases, to facilitate this step, it may be necessary to nip with scissors the attachment of the bladder to the broad ligaments at either side. As in the preceding step the ease or difficulty of execution of this part of the operation will in a great measure depend upon whether the patient is a nullipara or multipara. It is essential to make a good free separation of the bladder from the uterus and not to worry whether the peritoneal duplications (the vesico-uterine fold) passing over the base of the bladder to the anterior surface of the uterus be torn through or not. I never pay any atten-

tion to this point. We now have the bladder in the upper angle of the wound, behind the pubes, where it can be retained by a vaginal depressor if necessary, a free cav-

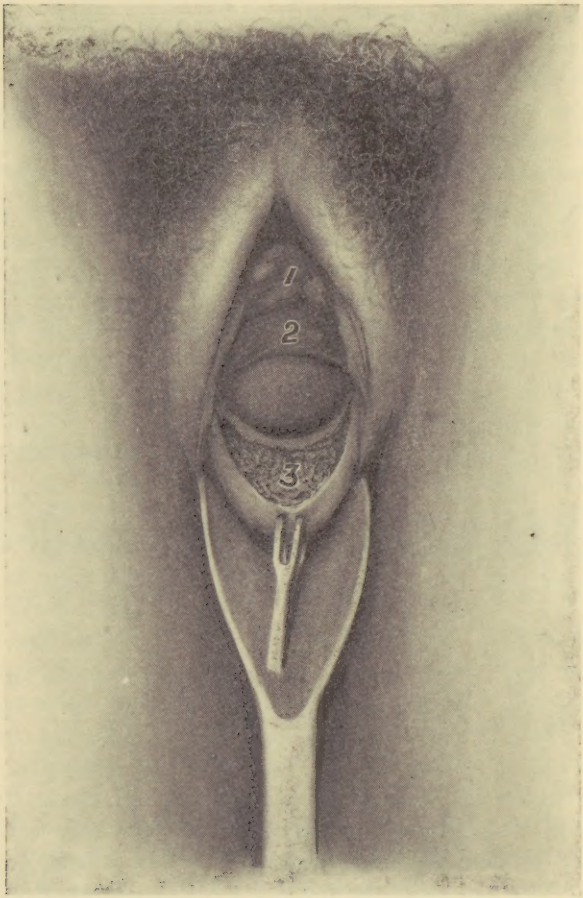

FIG. 4.—1, the bladder pushed up; 2, vesico-uterine space; 3, denuded cervix. (Winter.)

ity known as the vesico-uterine space and the denuded cervix (*vide* Fig. 4).

In the majority of cases of retroversio-flexions there is a prolapsus of the anterior vaginal wall. Even when there is no prolapsus, there is usually relaxation to a lesser or greater degree. Consequently, in nearly all cases an anterior colporrhaphy is indicated. In vagino-fixation this serves two purposes:

(1) To restore the width of the canal to its original dimensions.

(2) To form a better fixed point for the fixation of the uterus.

The colporrhaphy is now easily carried out by resecting a corresponding strip of tissue from either vaginal flap.

The next step of the operation consists in anteverting the uterus with a properly constructed sound (Fig. 5) so

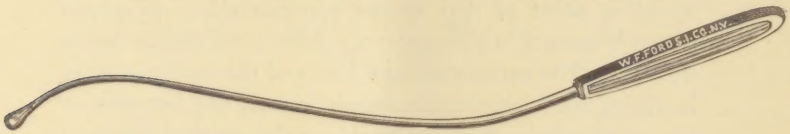

FIG. 5.—Author's sound.

that its body presents in the vaginal wound. It is of importance to have the right kind of a sound. I have known operators use a large steel prostatic sound, and they have either failed to antevert the uterus or have forced the point of the instrument through the uterine wall, and were compelled to do a cœliotomy. In some cases the uterus is readily anteverted, in others again considerable difficulty is experienced, owing to the small arc through which the sound can pass on account of a high and rigid perinæum. Hence the value of the curve at the lower end of the sound. In virgins and nulliparæ it might be necessary to

incise the perinæum so as to gain more room, but I have never had to resort to this, although I have done the operation in a virgin with a very small vagina and in several nulliparæ with narrow introituses and rigid perinea. In a few of these cases I have had to resort to passing a few provisional sutures through the uterine wall just above the internal os, and by traction on these forward and downward have aided in anteverting the uterus. Having got the uterus well forward and presenting in the vaginal incision we next proceed to suture it to the vaginal wall. With a moderately stout curved needle a silk suture is passed through the left vaginal flap at the extreme upper end of the incision—that is, from one to two centimetres below the urethral opening and about half a centimetre from the edge of the flap. The suture is then carried through the anterior wall of the uterus, as near the fundus as it is possible, and out through the right flap at a corresponding point to that of the opposite side. A second suture is passed in the same way about a centimetre below the first. The sutures are now tied and the vaginal wound is closed by a continuous catgut suture, the last one or two stitches being made to catch up the cervical tissue to avoid any pocketing. A couple of interrupted sutures may be passed to strengthen the line of coaptation, particularly if any tension exists (Fig. 6). Should there be a prolapsus of the posterior vaginal wall or a laceration of the perinæum, this is now attended to. The vagina is packed lightly with iodoform gauze and the patient put to bed. She is kept in bed for three weeks, the uterine sutures being removed at the end of the fifth or sixth week.

For the first few days the patient has to be catheterized. The duration of time during which catheterization has to be employed has varied in my cases from a few hours to five or six days. In the majority of cases the patients

have been able to void urine after the first movement of the bowels, from twenty-four to thirty-six hours after the operation. The operation is a perfectly safe one. Its mortality thus far is *nil*. This statement is based on two

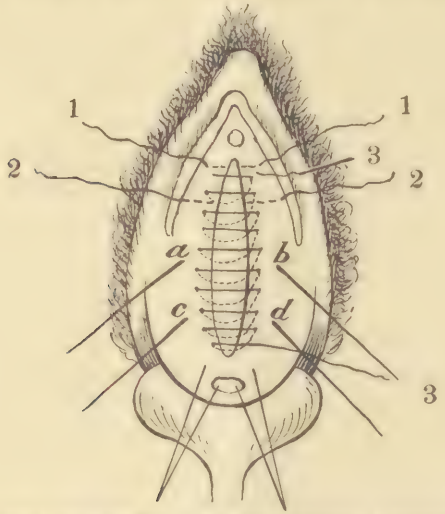

FIG. 6.—(Modified after Dührssen). 1, 2, uterine sutures; 3, continuous catgut suture; *a b*, *c d*, tension sutures.

hundred and twenty-four recorded cases, including the writer's seventeen cases (fourteen of his own and three in which he assisted).

Most of my patients were operated on in the poorer class of tenements, and amid dirty and squalid surroundings. The temperature, with only one exception, never went above 100°, and the convalescence in all was uneventful. In some of these cases an amputation of the cervix, an anterior colporrhaphy, and a perineorrhaphy were done at one sitting. Even when the results of the operation were not satisfactory, no untoward after-effects have been ob-

served. The operation was not always successful when adhesions were present. But of this later on.

The theoretical objection raised in some quarters against the operation of vesical disturbance is completely set aside by experience. In none of my cases have any bladder symptoms followed. The temporary retention immediately following the operation could not be considered such by even the most carping critic. On the contrary, in the majority of my cases there had been frequent and painful micturition, which disappeared after the operation. This experience tallies with that gained by others.

The indications for the operation coincide closely with those of Alexander's operation or shortening of the round ligaments. What these are for the latter have recently been defined by two of the most skillful operators and two of its ablest and warmest advocates.

Mundé * says: "Only a sharply retroverted or retroflexed uterus, with more or less descensus, with more or less relaxed vaginal walls, with perfect mobility of the uterus and annexa, justifies Alexander's operation." In a discussion at the last meeting of the American Gynæcological Society Edebohls demanded the existence of the following conditions for the success of the operation of shortening the round ligaments: "When the uterus can easily be put into normal position and will stay there, and the tubes and ovaries can be felt to be normal in size." † The indications for vagino-fixation, however, do not call for quite so closely drawn lines. The writer and others have obtained success with it when these conditions did not obtain. In some of my successful cases there was some thickening of one tube, and moderate enlargement of one or both ovaries. To be sure, the uterus must be perfectly mobile, or rendered so by

* *Medical Record*, July 14, 1894.

† *N. Y. Journal of Gynæcology and Obstetrics*, June, 1894, p. 843.

a prior course of tamponing or pelvic massage. But I would put the same limitation on the term "perfectly mobile" that Edebohls does. The uterus must be easily anteverted, and must remain in anteversion until the woman begins to walk about.

It may be asked, if there is enlargement of an ovary or some thickening of a tube, why not perform cœliotomy and ventro-fixation? The answer will be that each case must be analyzed for itself, and that every thickened tube and enlarged ovary does not require a radical operation. Polk and others have taught us what a curettage with or without packing of the uterus can do for the cure of many cases of moderate salpingo-oophoritis. Is a cure, then, not more likely to ensue upon a curettage plus an operation that remedies a retroverted or retroflexed uterus? Of course, if one or other of the tubes and ovaries is diseased to the extent beyond the hope of cure by a curettage and reposition of the displaced uterus, then cœliotomy and ventro-fixation are indicated.

It may be further pertinently asked, given the aforesaid conditions—a "perfectly mobile uterus," with slight or no disease of the annexa—is operative interference at all necessary? In a great many instances it is not. But every active gynæcologist and practitioner will meet in the course of a year a fairly large number of cases in which a pessary can not be worn, either on account of the discomfort or annoying discharge it produces or because the woman is unable or unwilling to go to a doctor weekly and have it removed and replaced. Again, there are some cases of mobile retroflexed uteri which can not be held in normal position by a pessary. I am aware there are some gynæcologists who will take issue with this statement, and who will maintain that failure is due to lack of skill in applying and fitting the instrument. This may be true; and if it is, it

puts a narrow limitation upon the number of specialists who have the necessary skill. Further, in a number of cases, some condition or conditions other than the mal-position exist requiring surgical interference, such as an obstinate endometritis, a laceration of the cervix or perinæum, or a cystocele and proctocele. Having to anæsthetize the patient any way, she may as well be submitted to the twenty or twenty-five minutes' further operative interference in order to do away with the need of wearing a pessary for months or years, or for the remainder of life.

It has already been stated that the indications for vagino fixation and Alexander's operation are similar, the wider boundaries being in favor of vagino-fixation. This operation may then be considered in the light of a friendly rival to shortening of the round ligaments. Further experience will teach us which cases are more suitable for the one or other operation. I do not belong to the class of men who decry Alexander's operation.

When such able and conscientious observers as Mundé, Edebohls, and Cleveland allege good results with it, I am content that the operation has a field of usefulness. But it is conceded by its advocates that it is a difficult operation to perform, that the round ligaments are sometimes difficult to find, that they are at times very thin, and that they may be so destroyed by fatty degenerations as to break in pulling the uterus forward.

Vagino-fixation fixes the uterus in a position corresponding more closely to the normal than do either shortening of the round ligaments or ventro-fixation.

Clinically, what is the normal position of the uterus? No better authority on this subject can be quoted than Professor B. S. Schultze, of Jena, whose labors in this field have established our present views regarding the normal

and abnormal positions of the uterus. He says:* "Chiari, Braun, and Späth say in their *Klinik der Geburtshülfe und Gynäkologie*, 1855, p. 375: 'The position of the virgin uterus is such that the body is joined to the cervix at an obtuse angle, opening downward and forward so that on an internal examination one can feel a large part of the anterior surface of the uterus through the anterior vaginal *cul-de-sac*.' As I commenced the systematic study of gynæcology in the autumn of 1854, this view was of the greatest value to me personally; it dominated over my first examinations, and recognizing its *accuracy* [Italics are mine], I was in a great measure prevented from acquiring false ideas on the position of the uterus."

The truth of this view I have been able to corroborate time and again in my examinations at the Mount Sinai Dispensary. During the past year the new cases in my service numbered 1,872, all of which were personally examined by me. Fully ten per cent. of these had perfectly healthy pelvic organs and their complaints were due to some gastric or intestinal disturbance or to early gestation. In these cases, when the conditions were favorable—viz., an empty rectum and bladder and not too rigid abdominal walls—the anterior surface of the uterus for almost its whole length could be felt lying against the anterior vaginal wall. Further, when a mobile retroverted uterus is replaced, it falls into this position just as a dislocated joint falls into normal relations when reduced. Further still, during the first few weeks of gestation in a healthy and normally placed uterus, the antero-posterior enlargement of the uterus will give rise to a distinct bulging in the anterior vaginal fornix. Now, the position of the uterus, after a properly performed vagino-fixation, conforms closely to

* *The Pathology and Treatment of Displacements of the Uterus.* New York, D. Appleton & Co., 1878, p. 48.

that just described as normal: "a large part of the anterior surface of the uterus" can be felt on internal examination through the anterior vaginal *cul-de-sac* (Fig. 7).

FIG. 7.—Profile view of uterus. The shaded area near the fundus, *a*, represents the union with the vaginal wall. (Modified after Dührssen.)

The results were good—that is, the uterus remained in anteversion and the patient was freed from her former symptoms—in all the cases (nine in number) in which the aforesaid conditions obtained. In other words, in suitable cases the cures were one hundred per cent. In one case of complete procidentia I was unable to complete the opera-

tion, owing to extensive adhesions between the uterus and bladder. In the remaining seven cases, in which adhesions to a greater or lesser extent existed, a symptomatic cure was obtained in some. In others the failure was complete, the uterus returning to its faulty position and the former symptoms recurring shortly after the patient left her bed. These, however, as well as the successful cases, will be discussed more in detail on another occasion. The first case (a successful one) was operated on October 4, 1893, nearly a year ago. The last case was done four months ago. One of the patients operated on November 6, 1893, was shown at the New York Obstetrical Society on April 17, 1894. Dr. E. H. Grandin (appointed by the chair to examine the patient) reported that he found the uterus in good position in the pelvis, fixed anteriorly to the cicatrix in the anterior fornix. The woman had told him that she now had no pain, although previously she had had some symptoms referable to the uterus, such as backache and dragging pain; in other words, the operation seemed to have a field of utility contrary to his previously formed opinion. He would like to see the case after a longer period had elapsed, because he thought it very problematical that the operation would give permanent results. (*Transactions of the New York Obstetrical Society;* the *New York Journal of Gynæcology and Obstetrics*, June, 1894).

The patient has been under my observation ever since. The uterus is in the same position as above described and she is free from all symptoms. There can be little doubt as to the permanency of the results. When the uterus retains its forward position for over nine months, in all likelihood it will remain so for ever. It has been the experience of the writer and others that when relapses occur they usually take place either shortly after the patient is up and begins to go about or during the first few months.

Pregnancy has taken place in several cases in which vagino-fixation had been done. Gestation progressed normally and the uterus was found in anteversion several months after labor at full term (Dührssen, Mackenrodt). As far as I am aware conception has taken place only in one of the cases operated upon by me. The gestation in this instance is thus far of only a few weeks' duration, but the woman is anxious to procure an abortion, in which evil intent she will no doubt succeed.

The following conclusions seem warranted:

1. Vagino-fixation is a safe operation.

2. It is not particularly difficult to perform.

3. The only special instrument required is a uterine sound of the proper shape and size.

4. The operation is indicated in mobile retroversions or retroflexions of the uterus that are attended with symptoms and which for one reason or another are unsuited for treatment by pessaries or tampons.

5. It is not attended with any untoward sequelæ.

6. It fixes the uterus in a position closely resembling that of the normal.

7. The results of the operation interfere in no way with the occurrence or course of gestation.

NOTE.—Since writing the foregoing I have performed the operation in three further cases with complete results thus far. In the last case, operated on four weeks ago, I modified the method of suturing the uterus with the object of shortening the period of the recumbent posture from three weeks to ten or fourteen days. It is too early as yet to speak of definite results. Should the method prove as successful as it promises, the gain will be not only a shorter stay in bed, but an important extension of the indications of the operation.

127 EAST SIXTY-FIRST STREET.